

### REMARKS

In response to the final Office Action mailed October 9, 2008 ("Office Action"), Applicant requests entry of this Amendment presenting rejected claims in better form for consideration on appeal by amending independent claims 1 and 54 to include limitations previously considered by the Examiner in dependent claims 10, and 12-14. Support for the claim amendments is found in the specification as filed, including paragraphs [0018]-[0019] of corresponding published US patent application no. US2005/0238870A1. No new matter is added. Claims 1-4, 6-17, 19-31, 49-54, and 56-59 are pending, with claim 16 withdrawn from consideration.

(I) The Examiner rejected independent claims 1 and 54, along with dependent claims 2, 8, 9, 15, 17, 19-23, 25, 26, 28-31, 49-53, and 56-59 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Jacobsen et al., US 6,530,943 ("Jacobsen") and Greene et al., US 2002/0177855 ("Greene"), in view of Smith et al., US 5,888,930 ("Smith") (Office Action at pages 4-6). The rejected claims cover compositions that include particle chains having at least two connected particles and a link that connects the at least two connected particles. At least one of the at least two connected particles has an interior region with pores having a mean size and a surface region with pores having a mean size, where the mean size of the pores of the interior region is greater than the mean size of the pores of the surface region.

Jacobsen and Greene describe chains of joined beads (Jacobsen, e.g., col. 2, lines 35-38) or embolizing elements along a filament (Greene, e.g., paragraph [0016]). Jacobsen emphasizes the importance of joining beads having a "central bore," and formed of a material having a particular density and surface porosity (Jacobsen, e.g., col. 4, lines 28-53).<sup>1</sup> The joined embolizing elements described in Greene are formed from a polymer with sufficient softness to be "coaxially skewered" along a carrier filament, or the embolizing elements are molded around

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<sup>1</sup> Jacobsen describes the importance of "selecting the material of the beads... [to] control the density of the string" to have beads that are less than the density of blood (Jacobsen, col. 4, lines 28-32) and having a surface porosity "to promote thrombogenicity" after implantation (Jacobsen, col. 4, lines 48-53). The beads of Jacobsen are formed with a "central bore" through which a filament is "threaded to maintain the beads connected together in a chain" (Jacobsen, col. 9, line 66 – col. 10, line 1).

the carrier filament (Greene, e.g., paragraphs [0016] and [0021] - [0024]).<sup>2</sup> Smith describes porous beads having very specific pore structures formed by precipitation methods that require certain specific combinations of solvents, non-solvent liquids and polymers (e.g., Smith at col. 3, lines 6-67; col. 5, lines 13-27).<sup>3</sup> Smith notably fails to disclose how to form such particles having the “central bore” and density requirements emphasized by Jacobsen, or the softness to permit “coaxial skewering” along a filament in the manner disclosed in Greene. The Office Action points to no basis for modifying the teachings of the porous particles in Smith to arrive at the claimed composition of connected particles.

The Office Action asserts that: (1) since both Jacobsen and Smith teach porous particles, the claimed compositions could be prepared by skewering the particles of Smith onto a carrier disclosed in Greene; and (2) the Jacobsen, Smith and Greene references are “presumed to be operable/enabling” as combined in the Office Action (Office Action at pages 4-6).

In particular, the Office Action states that “both Jacobsen and Smith teach porous particles... one could first prepare Smith’s particles, then skewer then [sic.] onto a filamentous carrier, as in Greene” (Office Action at page 6). Applicants respectfully disagree. The cited references, alone or in combination, do not disclose or render obvious joining the beads of Smith according to the teachings of Greene or Jacobsen, nor do Greene or Jacobsen disclose or render obvious the modification of the particles produced in Smith to obtain the claimed compositions.

The Office Action further states that “prior art is presumed to be operable/enabling per MPEP 2121...” (Office Action at page 5). However, each individual prior art reference is only presumed to be operable when it individually “expressly anticipates or makes obvious all of the

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<sup>2</sup> Greene discloses embolizing elements along the length of a filamentous carrier where formed by “coaxially skewering” softened embolizing elements along the carrier, or disposing a filamentous carrier in a mold followed by transferring polymer under pressure around the carrier in the mold (e.g., Greene, paragraphs [0016] and [0021] through [0024]).

<sup>3</sup> According to Smith, “[i]n order to achieve the continuously-grated pore structure of the beads of the present invention, the polymer, its solvent and the precipitation bath must all be specified” (Smith at col. 3, lines 49-51, emphasis provided); the solvent “must dissolve the polymer and be miscible with the liquid, typically water, used for precipitation” (Smith at col. 3, lines 3-5); the polymer “must be soluble in a suitable solvent and insoluble in a liquid that is miscible with the solvent (Smith at col. 2, line 67 – col. 3, line 1); the rate of solvent exchange with the liquid must be kept slow following a rapid initial precipitation (Smith at col. 3, lines 8-10); and the polymer solution may only contain a liquid nonsolvent in amounts “that the polymer does not begin to precipitate, but remains completely dissolved” (Smith at col. 4, lines 38-42).

elements of the claimed invention, the reference is presumed to be operable” (MPEP 2121, emphasis added). This presumption does not extend to a combination of references that requires modification of the references as a basis for an obviousness rejection. The asserted combination and modification of Jacobsen, Smith and Greene references, alone or in combination, is not presumed to be enabled.

This obviousness rejection is improper because the asserted combination of Jacobsen, Smith and Greene do not enable the claimed particle chains having a particle with a mean pore size in an interior region greater than the mean pore size in a surface region. Applicable caselaw clearly states that “[i]n order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method.” *Beakman Instruments, Inc. v. LKB Produkter AB*, 892 F2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989). A claim rejection for obviousness under 35 USC 103 is improper if the person of ordinary skill in the art would not be able to make a claimed composition or perform a claimed method upon reviewing the cited prior art without undue experimentation:

[r]eferences relied upon to support a rejection under 35 USC 103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. [citations omitted] An invention is not ‘possessed’ absent some known or obvious way to make it.” *In re Payne, Durden and Weiden*, 606 F2d 303, 314, 203 USPQ 245, 255 (CCPA 1979).

Under this standard, an obviousness rejection under 35 USC 103 of a composition claim is improper in “the absence of a known or obvious process for making the claimed compounds.” *In re Hoeksema*, 399 F2d 209, 274, 158 USPQ 596, 601 (CCPA 1968).

In this case, the obviousness rejection based on Smith, Jacobsen and/or Greene is improper under this applicable legal standard because one skilled in the art cannot make the compositions in the rejected claims based on the cited prior art, and the Examiner provides no basis to actually make the claimed connected porous particles. Undue experimentation would be required to make and use the claimed connected particles based on the asserted combination of Jacobsen, Smith and Greene. For example, the Office Action provides no explanation how these

references, alone or in combination, describe how to: (1) place a “central bore” in each bead produced by the method of Smith (as disclosed by Jacobsen), (2) select those particles (if any) produced by Smith having the pore density and surface porosity requirements described by Jacobsen, and/or (3) provide beads by the process of Smith having a softness adequate to permit joining the particles with the filamentous carrier as described by Greene.

Notwithstanding the arguments above, Applicants have elected to amend independent claims 1 and 54 to include limitations from claims 10 or 12 relating to the aspect ratio of the link or limitations from claims 13 or 14 relating to the ratio of the diameter of a particle and a link. Claims 10 and 12-14 are not rejected for obviousness over the combination of Jacobsen, Smith and Greene. Reconsideration and withdrawal of this rejection is requested.

**(II)** The Examiner rejected independent claims 1 and 54, along with dependent claims 2-4, 6-15, 17, 19-26, 28-31, 49-53, and 56-59 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Jacobsen, Greene and Smith (discussed above) in further view of US 6,605,102 (“Mazzocchi”) (Office Action at page 7). For the reasons noted above, the combination of Jacobsen, Greene and Smith does not render the subject matter covered by claims 1-4, 6-15, 17, 19-26, 28-31, 49-54 and 56-59 unpatentable under 35 U.S.C. § 103(a). Mazzocchi does not cure the deficiencies of these references. The Office Action asserts that Mazzocchi “is included to address that the claimed aspect ratios are known in the art to be desirable in an embolic device” (Office Action at page 7). Applicants respectfully disagree. Mazzocchi does not even relate to embolic devices. To the contrary, Mazzocchi describes filters to remove embolic particles from a blood vessel (e.g., Mazzocchi at col. 19, lines 53-64). In particular, Mazzocchi describes resiliently expandable tubular metal fabric devices forming a bell-shaped fabric disc oriented perpendicular to the axis of the metal fabric tube. These devices are used to form a temporary filter deployed to trap embolic particles within a body channel (e.g., Mazzocchi at col. 2, line 53 – col. 3, line 29 and col. 19, lines 53-64). Mazzocchi fails to disclose or render obvious particles joined by a link having an aspect ratio of at least

0.001 or an aspect ratio of at most 1,000, where the aspect ratio is the ratio of the length of the link to the width of the link (e.g., paragraph [0123] of the present application, published as US2005/0238870A1). Mazzocchi discloses an entirely different aspect ratio. Mazzocchi describes an aspect ratio of “the ratio of the length of the device over its maximum diameter or width,” which is desirably at least about 1.0 and preferably about 1.0 to 3.0 (Mazzocchi at col. 11, lines 59-63, emphasis added). Mazzocchi fails to disclose or render obvious particles joined by a link having the claimed aspect ratios.

Furthermore, the Office Action does not explain where the prior art references disclose or render obvious joined particles with the ratio of the diameter of one particle to the width of a link joining the particles being at most about 100 or at least about 0.001.

Applicants request reconsideration and withdrawal of this rejection.

**(III)** The Examiner rejected independent claims 1 and 54 with dependent claims 2-7, 15, 17, 19, 21, 22, 25-31, 49-53, and 56-59 under 35 U.S.C. § 103(a) as being unpatentable over Jacobsen in view of Mangin, WO 01/66016 (“Mangin”) (Office Action at pages 7-8). As discussed above, Jacobsen discloses a chain of particles having a central bore and a particular density. Mangin discloses unconnected embolic particles having voids present within the particles as well as on the surface of the particles, where the surface region has both large pores and small pores (e.g., Mangin, FIG. A), and the interior region also has both large pores and small pores (e.g., FIG. B). However, neither Jacobsen nor Mangin, either alone or in combination, discloses or renders obvious such particle chains

In response to Applicant's arguments, the Examiner states:

[a] single figure depicting a cross-section of a particle can be sufficient to demonstrate pore size distribution. This interpretation is supported by the instant specification, which shows only a cartoon of a single cross section, see Figure 5 of the instant Application (Office Action at page 8)

Applicants respectfully disagree. Figure 1A is a “schematic diagram showing the structure of an embolic particle” that “comprises voids at the surface” (Mangin at p. 5, lines 34-36). Mangin's Figure 1B is a cross-sectional view of the particle in Figure 1A that includes a two dimensional circular area representing one cross-section of the particle. As one skilled in the

art would understand, an “interior region” of a particle is three dimensional and a “surface region” of a particle is two or three dimensional and therefore to obtain features of the surface and interior regions of a particle, more than one cross-sectional view of the particle is required. Accordingly, one would also understand that even though Mangin's Figure B shows that the two dimensional circumference includes pores having larger sizes than the pores in the two dimensional circular area, one cannot conclude that in a three dimensional space, Mangin's particle includes a surface region that has pores with larger mean sizes than the pores in the interior region of the particle. To strictly analyze the distribution of pore sizes in Mangin's particles, infinite numbers of cross-sectional views as shown in Mangin's Figure B are needed. In fact, nowhere does Mangin disclose or otherwise indicate that his particles have an interior region with pores having a mean size and a surface region with pores having a mean size, where the mean size of the pores of the interior region is greater than the mean size of the pores of the surface region, as recited by the rejected claims. Applicants request reconsideration and withdrawal of the rejection of these claims.

**(IV)** The Examiner rejected independent claims 1 and 54, along with dependent claims 2-4, 6, 7, 15, 17, 19-23, 25-31, 49-53, and 56-59 under 35 U.S.C. 103(a) as being obvious over Jacobsen (discussed above) in view of Lanphere et al., US 2003/0185895 (“Lanphere”) (Office Action at pages 8-9). For at least the reasons noted above, Jacobsen does not disclose or render obvious the features of claims 1-4, 6, 7, 15, 17, 19-23, 25-31, 49-54, and 56-59. The Office Action maintains that “[b]oth Jacobsen and Lanphere teach porous particles” and that “[c]ombining the teachings of the references does not involve an ability to combine their specific structures” (Office Action at page 9).

As noted above, Jacobsen describes the importance of “selecting the material of the beads... [to] control the density of the string” to have beads that are less than the density of blood (Jacobsen, col. 4, lines 28-32) and having a surface porosity “to promote thrombogenicity” after implantation (Jacobsen, col. 4, lines 48-53). The beads of Jacobsen are formed with a “central bore” through which a filament is “threaded to maintain the beads connected together in

a chain” (Jacobsen, col. 9, line 66 – col. 10, line 1). Jacobsen does not disclose or render obvious particle chain compositions where an interconnected particle has a mean pore size that is greater in a surface region than an interior region. Lanphere does not cure the deficiencies of Jacobsen.

Lanphere discloses drug delivery particles that include a reservoir region having primarily larger pores and a metering region (e.g., Lanphere, Abstract). Jacobsen's particles in his particle chain do not include the features of Lanphere's particles. Therefore one skilled in the art would understand that Jacobsen's method of making his particle chains would not be suitable for making particle chains that include Lanphere's particles, and accordingly, one would not know how to make particle chains that include Lanphere's particles. In particular, the Office Action provides no explanation how these references, alone or in combination, describe how to: (1) place a “central bore” in each bead described by Lanphere (as disclosed by Jacobsen) and/or (2) select those particles (if any) produced by Lanphere having the pore density and surface porosity requirements described by Jacobsen.

Thus, neither Jacobsen nor Lanphere, alone or in combination, discloses or renders obvious the subject matter covered by claims 1-4, 6, 7, 15, 17, 19-23, 25-31, 49-54, and 56-59. Accordingly, Applicants seek reconsideration and withdrawal of the rejection of these claims.

Notwithstanding the arguments above, Applicants have elected to amend independent claims 1 and 54 to include limitations from claims 10 or 12 relating to the aspect ratio of the link or limitations from claims 13 or 14 relating to the ratio of the diameter of a particle and a link. Claims 10 and 12-14 are not rejected for obviousness over the combination of Jacobsen and Lanphere. Reconsideration and withdrawal of this rejection is requested.

**(V)** Applicants believe the application is now in condition for allowance, which action is requested. Please apply any charges or credits to deposit account 06-1050, referencing Attorney Docket No. 01194-459001.

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Respectfully submitted,

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